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ABSTRACT

Part of a three-volume report on the effects of school finance reform, this volume summarizes principal findings of the studies presented in the other volumes. The report summarizes school finance reforms enacted between 1972 and 1974 in California, Florida, Kansas, Michigan, and New Mexico. It recounts what happened to school taxing and spending in each state's districts; describes what happened to districts' spending opportunities; estimates how reforms and other factors affected the budgetary behavior of Michigan school districts; and speculates on why reforms in the five states had unexpected outcomes in the light of equalization aims. Overall, results of the studies indicate that although reform had brought some advances, especially in the area of more equal distribution of tax rates, success in equalizing spending outcomes and opportunities has been extremely modest. This outcome may be because reformers tried to pursue diverse and conflicting objectives and because add-ons and adjustments to basic state school finance plans often had disequalizing effects. (Author/JM)

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THE SEARCH FOR EQUITY IN SCHOOL FINANCE: SUMMARY AND CONCLUSIONS

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PREFACE

With support from the National Institute of Education (Contract No. 400-76-0160), The Rand Corporation analyzed the effects of recent school finance reforms in five states: California, Florida, Kansas, Michigan, and New Mexico. The study had two main objectives: (1) to describe the pre- and post-reform school finance outcomes in the individual states and to compare the differential outcomes of the reforms they adopted; and (2) to estimate the effects of fiscal and other factors on school districts' budgetary behavior. The overall purpose of the study was to provide information for officials in states that have yet to undertake or to complete reform, and for federal officials with responsibilities in the area of school finance.

The study results are reported in three volumes. The first, *The Search for Equity in School Finance: Results from Five States*, R-2348-NIE, by Stephen J. Carroll, presents the descriptive analysis. It examines, for each state: (1) pre- and post-reform distributions of revenues, expenditures, and tax rates; (2) the degree to which reform has been accompanied by an increase in intrastate fiscal neutrality; and (3) the kinds of districts that have benefited most (or least) from reform. It also compares these outcomes among the states and offers some general conclusions regarding the effects of these states' reforms.

The second report, *The Search for Equity in School Finance: Michigan School District Response to a Guaranteed Tax Base*, R-2393-NIE, by Rolla E. Park and Stephen J. Carroll, documents the analysis of school districts' budgetary behavior. The analysis focuses on Michigan districts because the other four states so constrain school districts' revenues or tax rates, or both, that the districts' choices cannot be observed. Econometric models are used to estimate the effects of different types of grants (federal or state, categorical, unrestricted block, or matching), the "prices" (or matching rates) of revenues per pupil to districts and to households, and characteristics of district populations on expenditures per pupil. The work

was partially supported by the Educational Policy Research Center for School Finance and Governance established at Rand under Contract No. 300-76-0065 with the Office of the Assistant Secretary of Education.

This volume summarizes the study's principal findings. It includes the major results of both the descriptive analysis and the analysis of districts' budgetary behavior, and speculates on why these school finance plans yielded the observed outcomes.

SUMMARY

In response to legal and social pressures, at least 22 states have enacted reforms in their school finance systems during the last seven years, usually in the name of equalizing spending or funding opportunities among school districts. The results have been mixed. Reform has brought about some advances; but judged in relation to the major goals that the proponents of reform have championed, the scattered victories of reform appear somewhat hollow.

This report summarizes the reforms enacted between 1972 and 1974 in California, Florida, Kansas, Michigan, and New Mexico. Using data generally covering 1972 through 1976, we recount what happened to school taxing and spending in each state's districts; describe what happened to districts' spending opportunities; estimate how reforms and other factors affected the budgetary behavior of Michigan school districts in response to the state's Guaranteed Tax Base plan; and speculate on why reforms in the five states had unexpected outcomes in light of equalization aims. We chose Michigan's school districts for econometric analysis because the other four states so constrain school districts' revenues or tax rates, or both, that the districts' choices cannot be observed.

The following are the study's principal findings:

- Reform brought impressive growth in district revenues in all five states, and declines in local property tax rates for education in all but Michigan. It appears that reform has contributed to the objective of increasing statewide total spending for education and reducing local educational property tax rates.
- The five states have made some progress toward a more equal distribution of revenues per pupil, but these improvements have generally been small, and for many districts there has been no improvement at all.

However, local property tax rates are now significantly more equal among school districts. To the extent that reform aimed at more equal spending, its accomplishments were very minor. To the extent that tax equalization was an aim, the results of reform have been substantial.

- Reform has done little to equalize the distribution of per-pupil instructional expenditures. (This result is consistent with other studies which have found, for example, that as districts' per-pupil budgets increase, they allocate decreasing proportions of their budgets to expenditures for teachers.) If educational quality is closely linked to instructional expenditures, and if the object of reform is to equalize the quality of education afforded students who live in different places, the states have dissipated much of the additional resources they have put into their reform efforts.
- Before reform, school revenues were ordinarily tied closely to the size of the local property tax base. Reform has substantially loosened that tie. Much of the fiscal advantages previously enjoyed by high-wealth districts have been eliminated by reform.
- Poor children--or, more accurately, districts serving disproportionate numbers of poor children--have not fared well in the wake of reform, in comparison with their higher-income counterparts. Generally, districts whose populations included more than the statewide median percentage of poor children had about the same school revenues and lower school tax rates compared with those serving higher-income children before reform. Reform has not much affected the distribution of revenues between poor children and rich children, while the tax rates levied by disproportionately poor districts increased relative to those levied by districts serving higher-income populations.

- Judging by the Michigan data, state matching grants have no effect on school district spending, and state block grants have very little effect: Spending increases by an average of only six cents for every dollar of state unrestricted grants. Federal and state categorical aid has a much stronger effect: A dollar of categorical aid increases district spending by 32 to 38 cents.

Two factors probably explain why reform accomplished relatively little in attempting to equalize spending outcomes and opportunities.

First, reform commonly tried to pursue objectives that were at once diverse and conflicting, such as equalizing revenues, preserving some local control over spending, trying to avoid the political hazards of cutting back on high-spending districts, providing tax relief, and avoiding excessive growth in state spending for schools. Because all these goals could not be achieved together, it was difficult to achieve much progress on any one front.

Second, each state tended to make add-ons and adjustments to its basic school finance plan usually with disequalizing effects. For example, Kansas' income tax rebates are disequalizing, as is Florida's cost-of-living adjustment. However appropriate such provisions may be for the needs of a particular state, they make it harder to meet the goals of revenue equalization in school finance.

ACKNOWLEDGMENTS

We are indebted to the National Conference of State Legislatures for data on the school districts of Florida and Kansas, to James Phelps, Associate Superintendent for Research and Administration, Michigan State Department of Education, for data on Michigan's school districts, and to Robert Brischett of the Intercultural Development Research Association for data on New Mexico's school districts.

We received useful advice on various aspects of the study from Dennis Doyle (National Institute of Education), James Fox (Office of the Assistant Secretary for Education), James Kelly (The Ford Foundation), David Mandel (National Institute of Education), Allen Odden (Education Commission of the States), and from our Rand colleagues Daniel Weiler, Arthur Alexander, Richard Cooper, Richard Fernandez, Paul Hill, David Lyon, and Arthur Wise.

We are particularly obligated to Stephen Barro of Rand, who formulated much of the original plan for this study and participated in the early phases of the descriptive work, and to Rolla Edward Park of Rand, who designed the econometric analysis of school districts' budgetary behavior and performed most of the work summarized in Sec. III.

Millicent Cox of Rand obtained the data employed in this study and performed the complex tasks required to combine information from a variety of sources into an accessible database for each state. William Lisowski of Rand performed the vast number of computations required to develop the statistical measures employed in the descriptive analysis.

We were not always able to follow the advice we received; any errors of commission or omission are our sole responsibility.

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I. INTRODUCTION

During the last seven years, at least 22 states have modified their educational financing systems. To date no standard model of reform has dominated the field.[1] States have employed different approaches to different degrees and in different combinations. It is frequently asserted, and it seems reasonable to believe, that these differences are justifiable, because the reforms undertaken should be appropriate to the prevailing circumstances in the states. At present, however, there is no consistent body of information either on what these reforms have accomplished in all 22 states, or on the relative effects of various approaches to reform.

This report summarizes the findings of Rand's study of the reforms enacted in five states--California, Florida, Kansas, Michigan, and New Mexico--whose new financing laws represent the major approaches to reform in the post-*Serrano* era. The study was conducted in two parts. The first undertook a descriptive analysis of the effects of reform in each state. The second included an econometric analysis of Michigan school districts' budgetary behavior.

The descriptive study examines the pre- post-reform distributions of per-pupil revenues, instructional expenditures per pupil, and local property tax rates in each state. It also investigates the degree to which school districts' per pupil revenues, expenditures, and local property tax rates were associated with their fiscal capacities or efforts before and after reform in each state--roughly speaking, their willingness to tax themselves. Finally, it describes the ways in which revenues, expenditures, and tax burdens have been redistributed among districts that differ in various characteristics. A

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[1]The word "reform" has normative connotations; it suggests that something is wrong and that change will improve or correct the situation. While we do not wish to imply that all recent changes in state school financing systems were necessarily for the better, we follow contemporary usage in the school finance community and refer to these changes as "reforms."

detailed discussion of the descriptive analysis is presented in Stephen J. Carroll, *The Search for Equity in School Finance: Results from Five States*, R-2348-NIE.

The econometric analysis focuses on school districts' decisions on how much to expend per pupil. We develop and estimate statistical models that relate per-pupil operating expenditures to policy variables--those under the control of the school district, the state government, and the federal government--and the characteristics of districts' populations. The analysis of school districts' budgetary behavior is presented in Rolla E. Park and Stephen J. Carroll, *The Search for Equity in School Finance: Michigan School District Response to a Guaranteed Tax Base*, R-2393-NIE/ASE.

Sec. II summarizes the principal findings of the descriptive analysis, and Sec. III those of the econometric analysis. Sec. IV offers speculations on why the observed outcomes occurred. The appendix presents summary results for the descriptive analysis.

II. THE EFFECTS OF REFORM ON REVENUES, INSTRUCTIONAL EXPENDITURES, AND TAX RATES

This section summarizes the effects of each state's reform on:

- The levels and distributions of current revenues,[1] instructional expenditures, and tax rates;
- The relationships between revenues or instructional expenditures and districts' fiscal capacities or efforts; and
- Various kinds of districts.

Because California's school pre- and post-reform finance systems specify different formulas for elementary, high school, and unified districts, the results are presented separately for the districts of each type. Similarly, Kansas's point-reform plan differentiates among small, medium, and large districts; we performed separate analyses for each type.

BACKGROUND

Reform advocates generally agree on the need for more equitable school finance systems, but agree far less on what kinds of systems are best for the purpose. Several types of systems have been championed in the reform debate. Some represent alternative means to accomplish the same objectives, but others reflect quite different notions of what would constitute an equitable school finance system.

Most, but not all, reform proposals embrace one or the other of two basic themes, or some compromise between them. The first is

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[1] Revenues equal the sum of local revenues, state noncategorical aid, and federal Impact Aid. This measure, in our view, best reflects the concepts expressed in the reform debate. Readers who take differing views, or who are interested in the effects of categorical programs, will find parallel analyses for alternative revenue measures that exclude Impact Aid and/or include state and/or federal categorical aid, in R-2348-NIE.

equalization of fiscal outcomes among the school districts within a state. The state's school finance system, in this view, should not allow any student (or taxpayer) to obtain a more expensive public education (or lower tax burden) than is available to others in the state. The pre-reform systems were therefore inequitable because they allowed students and taxpayers in wealthy districts (high per-pupil tax base) to obtain a more expensive education while enjoying a lower tax burden.

The prototype finance plan associated with the notion of equalizing fiscal outcomes is *full state assumption*. In the simplest version of this type of plan, the state mandates both the local tax rate and spending per pupil. Every district levies the tax rate and receives state aid equal to the difference between the local per-pupil revenues it raises at that rate and the state-mandated spending per pupil. Tax rates and school spending are then identical across the state.

The second theme is *equalization of fiscal opportunities* among the state's school districts. From this point of view, the pre-reform plans were inequitable because low-wealth districts had to levy much higher tax rates to achieve the same level of spending as high-wealth districts. The numerical disparity in school spending was less troublesome than the fact that low-wealth districts did not have the same ability to raise school revenues. This theme leads to fiscal neutrality as the objective of reform: a finance system in which any district can obtain the same level of funding as any other district, provided only that it put forth the same effort.

A type of plan variously termed Guaranteed Tax Base (GTB), power equalizing, or variable matching exemplifies the notion of fiscal neutrality. Typically, such a plan guarantees each district a given minimum revenue per pupil at each property tax rate. A district's state aid equals the difference, if positive, between the revenues it would raise at its tax rate if it had the state-guaranteed tax base per pupil and the revenues it actually raises at that rate.

In practice, equalization and fiscal neutrality embody conflicting concepts of what equity entails; they are not merely alternative paths to the same goal. Equal fiscal outcomes will result from a system that provides equal fiscal opportunities only if every district chooses to realize its opportunities to precisely the same degree. A diversity of communities are unlikely to have precisely the same taste for public education as compared with private goods and services and other public ones. Accordingly, if school districts are confronted with equal fiscal opportunities (i.e., a fiscally neutral school finance system), they will select different levels of funding. Conversely, districts will arrive at equal outcomes only if the school finance system precludes local choice and mandates both the funding level and the level of tax effort.

The tension between equalization and fiscal neutrality is reflected in the reforms studied here. Before reform, California, Florida, Kansas, and Michigan distributed state aid to the schools through foundation plans. New Mexico distributed flat grants to its school districts. The typical foundation system guarantees each district a minimum amount of funding per pupil (the foundation level) at a stipulated property tax rate. A district's state aid is the difference (if greater than zero) between the foundation level and the amount per pupil that the district could raise locally at the specified rate.[1]

After reform:

California combined a high-level foundation plan with differential expenditure growth limits. The foundation program very substantially increased state aid to low-wealth districts, while the expenditure growth limits allowed greater expenditure increases by lower-spending districts.[2]

Florida also retained the foundation program approach in its reform plan. An extensive system of adjustments for the distribution

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[1]See Barro (1974) for a more detailed description of the typical pre-reform school financing systems.

[2]The passage of Proposition 13, in June 1978, fundamentally changed the context of school finance in California. Our data, however, extend only through the 1976-1977 school year and thus pertain to the finance system then in effect.

of a district's pupils among 26 different categories, and an adjustment for the cost of living in the county served by a district, enter the computation of each district's guarantee. Local districts are limited to a narrow range of tax rates.

Kansas adopted a Guaranteed Tax Base (GTB) plan constrained by strict limits on expenditure growth. The growth-limits allow low-spending districts to increase their budgets more rapidly than can high-spending districts. The state's districts are divided into three enrollment categories; a separate guarantee is specified for each category.

Michigan introduced an unrestricted GTB plan with an upper bound on the tax rate for which state aid is paid. Districts may levy higher rates.

New Mexico has assumed full responsibility for school finance, while retaining the local district as the operating unit. The New Mexico plan allows no local discretion on districts' revenues or tax rates. A pupil-weighting system with adjustments for teacher cost differentials is used to determine each district's budget, and the schools are financed out of state funds plus a state-mandated local levy.

The main reform themes directed our interest toward the effects of each state's reform on the distributions of fiscal outcomes among its school districts, and on the relationships between its districts' fiscal outcomes and their fiscal capacities or efforts. Even casual observation confirms that many interested parties evaluate reforms in terms of their impacts on certain kinds of communities or people (e.g., central cities, low-income people); hence our interest in how various types of districts fared under each state's reform.

DATA

We obtained data from state sources on districts' revenues, expenditures, tax rates, wealth, and numbers of pupils. Data on the characteristics of the community served by a school district were obtained from the 1970 Census, fifth count, compiled to 1974 school district boundaries. We used the Census definitions of household

income, urbanity, race, and poverty level. We obtained data for the following years:

State	Year Reform Introduced	Years for Which Data Were Available
California	1973-1974	1970-1971 through 1976-1977
Florida	1973-1974	1972-1973, 1975-1976
Kansas	1973-1974	1972-1973 through 1974-1975
Michigan	1973-1974	1971-1972 through 1975-1976
New Mexico	1974-1975	1972-1973 through 1975-1976

In computing any measure employed in the descriptive analysis, we include all the districts in a state for which data were available. The distributions of revenues, instructional expenditures, and the tax rates, and the relationships between them and size, wealth, or tax rates are generally computed over all the districts in the state. The measures relating the distributions of those variables to income, urbanity, race, and poverty are computed over all districts that could be matched to the Census data.

To facilitate interstate comparisons, we adjusted all districts' assessed values to market values, and computed the effective property tax rate on market value. In making these adjustments we used ratios of property sales prices to assessed values for the given year at the lowest level of aggregation (district, county, or state) for which the data were available in each state.

LEVELS

Table 1 presents the pre- and post-reform revenues per pupil, instructional expenditures per pupil, and adjusted tax rates for each state in each year.

In all five states, the post-reform years saw impressive revenue growth, not all of which is solely attributable to reform, however. The states probably would have increased school revenues even if they had not modified their finance systems.

Table 1

REVENUES PER PUPIL, INSTRUCTIONAL EXPENDITURES PER PUPIL, AND ADJUSTED TAX RATES

State and Variable	*Pre-reform* 1970-71	1971-72	1972-73	*Post-reform* 1973-74	1974-75	1975-76	1976-77
Revenues							
California							
Elementary	745	780	860	999	1076	1196	1327
High school	1007	1058	1148	1230	1274	1388	1519
Unified	825	882	992	1078	1162	1277	1412
Florida			815			1149	
Kansas							
ADM below 400			1200	1274	1488		
ADM 400 to 1299			881	996	1119		
ADM 1300 and above			772	907	1035		
Michigan		845	901	1014	1123	1242	
New Mexico			650	659	874	983	
Instructional expenditures							
California							
Elementary	553	591	634	717	684	746	821
High school	723	769	809	869	781	830	899
Unified	628	665	712	792	715	757	833
Florida			625			853	
Kansas							
ADM below 400			746	761	848		
ADM 400 to 1299			595	621	688		
ADM 1300 and above			563	575	643		
New Mexico			512	551	614	709	
Adjusted tax rates							
California							
Elementary	7.2	7.4	7.6	6.7	6.7	7.0	6.9
High school	5.6	5.7	6.0	5.3	5.2	5.5	5.4
Unified	11.3	11.8	12.1	11.1	11.6	11.8	11.7
Florida			8.1			6.5	
Kansas							
ADM below 400			5.0	5.7	5.9		
ADM 400 to 1299			5.8	5.4	6.0		
ADM 1300 and above			8.1	7.4	7.7		
Michigan		12.3	12.1	12.7	13.2	13.6	
New Mexico			3.9	3.7	3.7	3.0	

NOTES: Instructional expenditures were unavailable for Michigan. California eliminated its instructional expenditures compilation in 1975-1976. We aggregated the accounts that had been included in instructional expenditures prior to then; the 1975-1976 drop in per-pupil instructional expenditures in all three types of California districts probably reflects some difference between our calculation and the procedure California had used to calculate instructional expenditures. All results are based on student-weighted observations. Parallel results, obtained using the district as the unit of analysis, are available in S. J. Carroll, *The Search for Equity in School Finance: Results from Five States*, The Rand Corporation, R-2348-NIE, March 1979.

The post-reform growth in revenues is even more impressive when contrasted with the pattern of school tax rates, which generally dropped sharply in the first year of reform. Tax rates were higher after reform only in Michigan and in Kansas's small and medium districts.

The results for Michigan are particularly interesting. Michigan imposed no limits on school districts' revenues or taxes, but neither one increased dramatically. Nor did the shift from the foundation plan lead districts to cut their spending or even fail to keep pace with the rates of growth in revenues in other states.

Neglecting the California data, instructional expenditures per pupil have grown in every state in every year, but their rate of growth is in every case lower than the rate of growth of revenues. The same is true for all three types of California districts in the pre-reform years and over the 1974-1975 to 1976-1977 period. It seems to be generally true that school districts do not translate increases in their per-pupil revenues into proportional increases in their instructional expenditures per pupil.

These results are consistent with previous studies of school districts' expenditure behavior (Alexander, 1974; Barro and Carroll, 1975; Carroll, 1976) which found that as districts' per-pupil budgets increase, they allocate decreasing proportions of their budgets to expenditures for teachers. Taken together, these observations suggest the following hypothesis: School districts broadly agree on what constitutes an acceptable instructional program and exert every effort to provide one. In doing so, low-revenue districts make do with disproportionately few noninstructional resources. Districts with higher revenue per pupil provide a somewhat costlier instructional program, but devote much larger shares of their budgets to non-instructional purposes. When a low-revenue district's budget is increased, it improves its instructional program somewhat, but devotes a much larger share of its additional revenues to "catching up" in terms of noninstructional resources.

DISTRIBUTIONS

We computed indexes of the distributions of revenues per pupil,[1] instructional expenditures per pupil, and adjusted tax rates in each state each year. The results suggest three conclusions:

- Reform efforts in these five states have brought about somewhat more equal distributions of per-pupil revenues.
- Reform reduced disparities in per-pupil instructional expenditures very little, if at all.
- Reform has generally led to more equal distributions of adjusted tax rates.

Distributions of Revenues

Revenue disparities among California's unified districts and in New Mexico dropped sharply in the post-reform years. However, about half the decline observed in New Mexico could be attributed to the treatment of Impact Aid revenues in the state's reform plan. The state's virtually complete assumption of school finance responsibilities account for the other half of the decline in revenue disparities among its districts. Smaller improvements in the distributions of revenues are found in California elementary districts and in large Kansas districts. Otherwise, reform has not much affected revenue distributions.

Regardless of what these states sought to accomplish, their reform plans generally wrought little change in the distributions of per-pupil revenues, and, as we shall see below, the same kinds of districts

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[1] Table A.1 in the appendix presents the results for one commonly used distributional index, the coefficient of variation, which is the standard deviation divided by the mean. A value of, say, .22 means that approximately two-thirds of the students in a state attend districts where revenues (instructional expenditures, tax rates) are within 22 percent of the mean, about one-sixth are more than 22 percent above the mean, and about one-sixth are more than 22 percent below the mean. Thus, a reduction in the coefficient from one year to the next implies that districts are, on average, relatively closer to the mean in the second year; the distribution has become more equal.

are found in the upper and lower portions of the distribution. In each of these states, the districts that had relatively high revenues before reform have high revenues after reform.

It may be that a distribution of revenues is "inequitable" when it stems from one finance system and "equitable," or at least less inequitable, when it is generated by another. But most of the arguments put forward by reform proponents suggest that the distribution itself is at issue. From that perspective, only New Mexico and California, in its unified districts, have substantially improved the distribution of revenues. The other states have changed the rules whereby districts raise local revenues and receive state general aid, but they have not much changed the consequences.

Distributions of Instructional Expenditures

In general, instructional expenditures per pupil are no more equally distributed after reform than they were before, in spite of the impressive growth in revenues.

In all five states, districts that enjoy high revenues allocate a large share of them to noninstructional purposes. Furthermore, in those cases where disparities in per-pupil revenues declined, there were smaller declines in disparities in instructional expenditures. This reinforces our earlier conjecture that when reform results in substantial increases in a previously low-spending district's revenues, it tends to put those funds to noninstructional uses.

What all this implies depends on one's view of the relationship between noninstructional expenditures and the objectives of reform. Some of those expenditures (e.g., for adult education) appear to be peripheral to the main reform themes. Others, however, may directly contribute to achieving the objectives of reforms. Improving plant operation and maintenance, for example, may be important in a district where previous funding deficiencies precluded adequate upkeep on buildings and equipment. At one extreme, if all school resources are equally important, it is a matter of little consequence how districts use the additional revenues they derive from reform. At the other

extreme, if educational quality is determined by instructional expenditures, and if the object of reform is to equalize the quality of the education afforded students who live in different places, then the states have dissipated much of the additional resources they have put into their reform efforts.

Distribution of Tax Rates

In every state except Florida, disparities in the distribution of adjusted tax rates fell by more than 25 percent between pre-reform and the post-reform years. New Mexico entirely eliminated variation in local educational property tax rates. Even in Michigan, where reform was accompanied by an increase in the average adjusted tax rate, the distribution of tax rates was dramatically equalized by reform.

FISCAL NEUTRALITY

We explored the effects of each state's reform on three different concepts of fiscal neutrality. Two reflect the relationship between revenues (or expenditures) and fiscal capacity--measured alternatively by the property tax base per pupil and household income per pupil. The third reflects the relationship between revenues (or expenditures) and fiscal effort--measured by the property tax rate. In each case, as the measure of neutrality, we use the elasticity[1] of revenues per pupil (or expenditures per pupil) with respect to wealth per pupil (or household income per pupil or tax rates).

[1]The elasticity of one variable with respect to another is the percentage change in the first variable that is, on average, associated with a one-percent change in the second. An elasticity of revenues with respect to wealth of .195 means that the average district's revenues increase by .195 percent with each one percent increase in its wealth. The elasticities reported here were obtained from quadratic regressions of revenues per pupil (or instructional expenditures per pupil) on wealth (or on household income per pupil or on tax rates).

A widely accepted version of the fiscal neutrality concept refers to the relationship between districts' revenues (or expenditures) and their property tax bases. According to this view, fiscal neutrality requires that revenues per pupil be independent of property tax bases; that is, elasticities of revenues with respect to wealth should equal zero.

Post-reform elasticities of revenues with respect to the tax base are below those for the pre-reform period in California, in Kansas's large districts, and in New Mexico. The results for Florida, Kansas's small and medium districts, and Michigan show little or no improvement in wealth neutrality.[1]

Turning to the results for instructional expenditures, a little improvement occurred in Kansas's small and medium districts. Otherwise, the post-reform elasticities in each case are not much different from the pre-reform period.

- Reform has generally reduced the degree to which revenues depend on wealth.
- Instructional expenditures per pupil are generally as closely related to property tax bases after reform as they were before.

The school finance reform movement originally grew out of a concern for the distribution of revenues among districts serving students of various income levels. The association between districts' revenues per pupil and the average income of the populations they serve appoximates this concept of fiscal neutrality. (See appendix Table A.3.) By this measure, reform improved the income neutrality of per-pupil revenues in California and Michigan, and worsened it in all three types of Kansas's districts. Florida's reform introduced substantial income bias into what had been an income-neutral distribution of revenues. In New Mexico, district revenues were independent of income both before and after reform.

[1] Table A.2 presents the elasticities of revenues per pupil and of instructional expenditures per pupil with respect to wealth per pupil.

Reform has reduced the income bias of the distributions of instructional expenditures in California's high school and unified districts. More income-biased distributions of instructional expenditures have resulted from reform in Florida, and in Kansas's small districts.

- o Although income neutrality improved in some cases, the distributions of revenues and instructional expenditures per pupil are, in other cases, more income-biased after reform than they were before. Some school finance reforms have worsened the relationship that originally gave rise to the reform movement.

A third version of fiscal neutrality holds that fiscal neutrality is not violated if districts with high per-pupil revenues or expenditures obtained them because they shouldered heavier tax burdens. To the extent that variations in revenues or expenditures are explained by variations in adjusted tax rates, equal efforts are bringing forth equal returns. A higher elasticity of per-pupil revenues with respect to the tax rate implies that variations in tax rates lead to greater variations in tax revenues. (Appendix Table A.4 presents elasticities of per-pupil revenues and instructional expenditures with respect to property tax rates.)

Among California's high school and unified districts, and in Kansas's small and medium districts, higher-tax districts had lower revenues before reform (the elasticity of revenues with respect to the tax rate was negative). Reform reversed the relationship, a clear improvement according to this view of fiscal neutrality. Revenues became more closely tied to tax rates in Kansas's large districts and in Michigan. New Mexico, by eliminating all variation in local effort, eliminated any link between effort and outcome. And Florida substantially reduced the relationships between districts' efforts and their rewards.

Kansas improved the tie between instructional expenditures and tax rates. Elsewhere, that relationship either was not affected (California's high school and unified districts) or substantially worsened (California's elementary districts, Florida, and New Mexico).

- o Revenues and instructional expenditures are more closely related to tax effort in some cases, but less closely in others.

WINNERS AND LOSERS

What kinds of districts and students gained from reform? Who lost? (Appendix Tables A.5, A.6, and A.7 present summary results.)

- o Reform has generally not affected the distributions of revenues or instructional expenditures among different kinds of districts.
- o Reform has generally reduced disparities in distributions of adjusted tax rates between different kinds of districts.

We find that the division of per-pupil revenues between pupils in small and large districts was mostly unaffected by reform in eight of the nine cases. Similarly, reform has not much affected the division of revenues between less and more urban districts in six of nine cases, between less white and more white districts in seven of nine cases, and between districts where the incidence of poverty is low and those where it is high in seven of nine cases.

There are even fewer exceptions in the case of instructional expenditures. In Florida, reform has led to a relative decline in the per-pupil instructional expenditures of smaller, of less urban, and of more poverty-prone districts. And among Kansas's small districts, those with a low incidence of poverty enjoyed a relative gain in instructional expenditures per pupil. None of the remaining cases show substantial changes between pre-reform and post-reform years.

Somewhat more substantial reform effects pertain to the distribution of adjusted tax rates between districts with high and low incidence of poverty. Before reform, adjusted tax rates were often substantially higher in the better-off districts. In every case, reform was accompanied by relative reductions in these tax burdens, and often the reductions were large.

Otherwise, the only departures from the general pattern of little change occurred in New Mexico, which fully equalized tax rates; in Kansas's small districts, where reform largely eliminated the relative advantage of relatively white districts; and in California's unified districts, where reform shifted the relative advantage from more urban to less urban districts.

CONCLUSIONS

Its original proponents viewed school finance reform as an issue of educational equity. They assumed that more spending is associated with better schooling, so that disparities in school spending imply disparities in educational quality. They also assumed that poor people live in property-poor districts, at least more so than in property-rich districts. Finally, they observed that state finance systems were only mildly equalizing at best and argued that existing systems discriminated against poor children by affording them an education inferior to that of other children.

In a few cases, reform has improved either fiscal neutrality or wealth neutrality or both, but *reform has not generally brought about distributions of revenues or instructional expenditures that correspond better to fiscal efforts or correspond less to wealth.*

All in all, reforms in these five states have not dramatically altered the relationships that originally gave rise to reform efforts. Reform has worked some improvements in educational equity, but in most instances *post-reform distributions of revenues and instructional expenditures are remarkably similar to what they were before.*

These reforms have made considerable progress toward other objectives, however, such as tax equity. In every case except Florida, disparities in adjusted tax rates have narrowed dramatically. And reform promoted greater equality in the distributions of adjusted tax rates between large and small districts, between more and less urban districts, between districts serving many and few whites, and between districts with high and low incidence of poverty. *Reform seems to have been a generally effective device for equalizing the burdens of supporting education.*

It also appears that *reform has generally furthered the objective of increasing statewide total spending for education.* In principle, equalization could have taken the form of redistributing revenues from high-spending to low-spending districts. Presumably, however, such an approach is politically unworkable. Reform states have instead chosen to increase state educational aid, attempting thereby to raise lower-spending districts' revenues without significantly reducing those of higher-spending districts. The result is to increase the share of state revenues going to public education above what it would otherwise have been. To be sure, the states might have increased their support for education even if they had not modified their finance systems. But legislators' reluctance to tax the residents of high-spending districts to support education in lower-spending districts has so far required that equalization, if it is to be obtained at all, be obtained by leveling up the distribution of revenues. This approach, in turn, requires increased state contributions to education.

III. SCHOOL DISTRICTS' BUDGETARY BEHAVIOR

This section summarizes an analysis of the budgetary behavior of Michigan school districts over the 1971-1972 through 1975-1976 school years. We estimated econometric models that relate expenditures per pupil to different types of grants (federal or state, categorical, unrestricted block, or matching), to the "prices" (or matching rates) of revenues per pupil, and to characteristics of districts' populations. Our data were for 451 districts in each of the five years.

BACKGROUND

The class of finance plans variously termed guaranteed tax base, district power equalizing, or variable matching systems figure prominently in the school finance debate.[1] These plans provide more equal fiscal opportunities to school districts if they wish to take advantage of them; the choices are left up to the local citizenry. Any district can obtain the same revenues per pupil as any other district if it levies the same local property tax rate, regardless of any differences in their property tax bases or other characteristics.[2] It is also free to choose a higher or lower tax rate. Local governments are able to select whatever level of service they (their constituents) desire and are willing to support.

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[1] The terms "guaranteed tax base" and "variable matching" generally refer to a formula that ensures each district a minimum revenue per pupil for each unit of tax effort. "District power equalizing" (DPE) generally refers to a plan that also allows each district no more than the guaranteed amount of revenue per unit of tax effort. That is, a DPE plan is a GTB plan with full recapture of "excess" local revenues.

[2] Fiscal opportunities are equalized up to a point, if, as in Michigan, there is an upper bound on tax rates beyond which the guarantee no longer applies. Districts whose tax bases exceed the guarantee continue to have a fiscal advantage in the absence of a "recapture" provision.

But GTB plans are risky. On the one hand, depending on school districts' responses to a plan, the state may be confronted by an aggregate aid obligation that exceeds its ability or willingness to support the schools. On the other hand, aggregate school spending or spending in some particular district or type of district may fall below what is considered to be the socially or politically desirable minimum.

Distributional issues also arise. Low-income communities may not be able to afford the tax rates they would have to levy to keep pace with higher-income communities. What if disproportionately minority communities systematically levied lower tax rates than did heavily white communities? The responses on either side may truly reflect communities' local preferences and budget constraints. But the argument that low-income or minority communities were "free" to respond as did their higher-income or majority counterparts and would have obtained the same per pupil revenues if they had done so, may not satisfy those concerned with the distribution of public services among different populations. For that matter, many reform advocates would object to substantial inter-district differences in school spending even if they were not systematically related to districts' characteristics. The question of how school districts will respond to the incentives inherent in a GTB plan is central to the debate over what constitutes an appropriate school finance system.

In 1973, Michigan introduced a GTB plan according to which the state guaranteed each district $38 per pupil for each mill of property tax effort up to 22 mills. Districts levying less than 22 mills received per-pupil matching grants equal to its tax rate times the difference (if positive) between $38,000 and their per-pupil tax base. Districts that levied 22 mills or more received unrestricted block grants per pupil equal to .022 times the difference (if positive) between $38,000 and their per-pupil tax base.

By matching locally raised tax dollars with state aid, the plan effectively lowered the "price" of expenditures to school districts. In 1973-1974, for example, a district with per-pupil assessed value

(AV) of $28,500 and a property tax rate of 20 mills would obtain total revenues of $760 per pupil at a local cost of $570 per pupil.[1] If the district raised its property tax rate by one mill it would increase local revenues by $28.50 per pupil, and the state would provide additional matching aid in the amount of $9.50 per pupil. Thus, the districts' residents would have to spend only 75 cents to increase total revenues by $1. In contrast, state aid to a district whose tax base exceeds $38,000, or whose tax rate is above 22 mills, is fixed. At the margin, such a district would have to raise $1 locally in order to increase its expenditures by $1.

In theory, we would expect a district faced with a lower price to "buy" more educational revenues. But how much more? And how do other factors affect its budgetary behavior, such as the amounts of state and federal categorical aid available to a district, or the "tastes" of its population for public education as opposed to private education and other goods and services?

RESULTS

The results presented here are couched in the terminology of statistical analysis. The reader without a background in statistics may wish to proceed to this section's "Conclusions," for which those results merely form the analytic basis.

Table 2 lists the variables used in the analysis; most are self-explanatory. The "price" faced by a district is 1 for all districts in 1971-1972 and 1972-1973. In the last three years, for districts whose assessed value per pupil (AV) is below the guarantee and whose tax is below the matching limit, it is the ratio of assessed value to the guarantee. For all other districts, it is 1.

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[1]The 20 mill local property tax would generate local revenues of $570 per pupil (20 mills times $28,500). The state, however, guarantees that a 20 mill tax rate will generate total revenues of $760 per pupil (20 mills times $38,000). State aid per pupil would thus be $190 per pupil ($760 - 570).

Table 2

ELASTICITIES OF EXPENDITURES PER PUPIL

Variable	Regression Coefficient: 1974-1975 Cross-section	Regression Coefficient: Pooled
Cost to district of $1 per pupil increase in expenditures (price)	-.12 (4.23)	-.02 (2.90)
Unrestricted state block grant/pupil	.03 (7.65)	.005 (5.08)
State categorical aid/pupil	.07 (6.45)	.02 (6.50)
Federal categorical aid/pupil	.02 (3.60)	.02 (7.99)
Dummy variable for fifth year		-.06 (13.24)
Pupils this year/pupils last year	-.57 (4.84)	-.32 (11.26)
Product of pupils/household, residential share of tax base, and median/mean value of owner-occupied home	-.02 (1.04)	.003 (1.28)
Assessed value/pupil	.20 (7.63)	.10 (10.20)
Median household income	.08 (2.74)	.04 (1.52)
Ratio of owner-occupied to total dwelling units	-.20 (3.79)	-.20 (4.06)
K-12 private school pupils per capita	-.05 (.22)	-.08 (0.38)
Fraction of families in poverty status	-.03 (2.10)	-.04 (2.42)
Fraction of employed persons 16 or older working as professional, technical, or kindred	.02 (1.20)	.04 (2.39)
Nonwhite fraction of population	.36 (4.44)	.50 (6.30)
Urban fraction of population	.10 (3.78)	.13 (5.52)
Fraction of population 55 or older	-.02 (.94)	.01 (0.51)
Fraction of population 55 or older still in same house as 5 years ago	.05 (1.24)	.03 (0.96)
Population	-.01 (1.79)	-.005 (0.85)
Year (1 in 1971-1972, ..., 5 in 1975-1976)		.04 (8.38)
Year squared		.02 (11.99)
Constant	5.14 (20.41)	5.80 (25.91)
R^2	.69	.80[a] (.96)[b]

NOTES: The dependent variable is the natural log of per-pupil expenditures; all independent variables except the dummy for fifth year, year, and year squared are also in natural logs. The pooled equation assumed an autoregressive error structure and was estimated by an iterative GLS procedure. T-statistics given in parentheses.

[a] Corresponds to R^2 conventionally reported for OLS regressions; obtained from sum of squared errors using reported coefficients to compute fitted values of the dependent variable.

[b] R^2 based on sum of squared errors from the regression using the GLS transformed variables.

Michigan's state aid program was not fully funded in 1975-1976. We introduced a *dummy variable for the fifth year* to control for the effects of the shortfall.

If we take the representative household to be the one in a median-valued, owner-occupied house, the cost of a $1 per pupil increase in total revenues is the cost to the district times the product of three terms: the number of *pupils per household*, the *residential share of the property tax base*, and the *ratio of median to mean value of owner-occupied housing*. That is,

$$\frac{V}{GTB} = \frac{AV}{GTB}\,\frac{N}{H}\,\frac{R}{AV*N}\,\frac{V}{R/H} \quad ,$$

where V = the assessed value of the median-valued house,
GTB = the state guarantee,
AV = assessed value per pupil,
N = number of students,
H = number of households, and
R = total assessed value of residential property.

We estimated several alternative cross-sectional models for the individual years. The results were similar across models in a given year and across years. The second column in Table 2 provides a representative equation from 1974. We also estimated several alternative models that pooled cross-sectional and time-series data. The last column in Table 2 presents the results for a representative model. Of all the equations, it was the most plausible. In any case, the results differed little from those obtained with other models.

We find that the coefficient of the "price" of education to the district is very small, and only marginally significant at best. As a practical matter, it does not matter much whether it is significant or not, since an elasticity of -.02 (in the pooled equation) is hardly useful as a policy tool. For example, changing the matching

rate from 0 to 1--a 50 percent reduction in the price of education to the district--would increase spending only 1 percent. We also find that state block grants exert a very small influence on expenditures. The elasticity of .005 (in the pooled equation) implies that a 1 percent increase in unrestricted state aid, about $1.00 per pupil for the average district, would cause a .005 percent increase in spending--only 6 cents per pupil.

The coefficients for the other forms of aid are much larger. They imply that expenditures increase about 32 percent of the amount of state categorical aid, and about 38 percent of the amount of federal aid.[1]

The composite term that adjusts the price of education to a district to obtain the price of education to a household is marginally significant. It appears that districts are responsive to their constituents' perceptions of the cost of education.

We find significantly higher expenditures in school districts serving populations that are wealthier, higher-income, employed in higher-level positions, more minority, and more urban. Expenditures are significantly lower in school districts serving populations that more frequently live in owner-occupied housing and that are more frequently in poverty.

CONCLUSIONS

The Michigan data provide no evidence that state matching or block grants do much to stimulate school district expenditures. For whatever reasons, school districts in Michigan have not (as yet) responded appreciably to changes in the implicit price of school expenditures.

It may be that Michigan school district decisionmakers or voters, or both, simply do not value educational expenditures very highly.

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[1] A 1 percent increase in state categorical aid, about 64 cents per pupil for the average district in 1975, would increase per pupil expenditures about .0174 percent (pooled regression)--just under 21 cents per pupil in the average district where expenditures were $1197 that year. Similarly, that year a 57 cent increase in federal aid per pupil (1 percent for the average district) would swell expenditures about .0179 percent (pooled regression)--about 21 cents per pupil.

Even if they are concerned about school quality, they may base allocative decisions on some measure of quality that has little to do (at least in their minds) with educational expenditures. Nor are they necessarily wrong. An immense volume of research has yet to establish a relationship between school spending and students' achievement. (See, for example, Averch et al. (1974).) In any event, Michigan's school districts may not have tried, or succeeded when they did try, to convince the voters to the contrary. The "price" inherent in the GTB plan would then be irrelevant to their decisions.

Alternatively, school districts or voters may equate the "cost" of education with the local property tax *rate*. As Feldstein notes, the education community in general and the school finance community in particular have confused the school tax rate with the "price" of education. The GTB plan provides every district (below the matching ceiling) with identical marginal tradeoffs between local tax rates and expenditures. Those may not be the relevant tradeoffs, but they may be what actually motivate budgetary decisions in most districts. There would then be no "price" response because there would be no perceived "price" differences among districts.

Finally, it should be noted that our data pertain only to the first three years of Michigan's GTB plan. Michigan districts may become more responsive to price in the future.

IV. WHY REFORM DID NOT ACHIEVE MORE

The rhetoric of school finance reform has focused on disparities in school district spending. Virtually all participants in the reform debate--the courts, state legislators and executives, the press, and numerous private individuals and agencies--have framed their remarks in the context of revenue (or spending) equalization or fiscal neutrality. The reform laws enacted thus far, according to their preambles and the speeches and press releases that accompanied them, were designed to bring about more equal or fiscally neutral distributions of revenues.

By those criteria, reform has not accomplished a great deal. Revenues have increased greatly, but are generally not distributed much more equally than they were before. Some reform plans reduced the relationship between school districts' revenues and their property tax bases, but others did not. Even in those cases where wealth neutrality was improved, wealth continued to be an important determinant of revenues. Reform has had mixed effects on the relationship between revenues and household income. Similarly, in some states, districts' revenues more closely reflected their fiscal efforts after reform; in others, fiscal effort became a less important determinant of a district's revenues. Finally, reform has had little effect on the distributions of revenues among various kinds of districts. In all cases, the kinds of districts that had greater revenues per pupil before reform turned out to have greater ones afterwards.

There has been some progress toward equalization and fiscal neutrality, but one is led to wonder why the complete restructuring of state school finance systems has fallen short of its ostensible goals. Below, we offer some possible explanations.

DIVERSE OBJECTIVES

Each of the reforms appears to have been designed to serve several different purposes simultaneously. We do not mean to imply

that the plans' developers, or the legislators who enacted them, or the governors who signed them into law, necessarily had any particular set of objectives in mind. But regardless of what they wanted to accomplish, or thought that the plans would accomplish, the structures of the plans are compromises among diverse, and sometimes conflicting, goals.

We have noted the tension between equalization and fiscal neutrality. Although much of the school finance literature describes these concerns as alternative paths converging on the same goal of equity, they are in fact two separate paths leading to two separate goals based on differing concepts of equity. It is unlikely that all the districts in a state would choose to levy the same tax rate under any school finance system, even if they would all thereby obtain the same revenues per pupil. The only way to achieve a high degree of equalization, consequently, is to narrowly constrain school districts' freedom of decision regarding budgets and tax rates, which means a loss of local control. But local control is central to the concept of fiscal neutrality.

A school finance plan can be oriented toward fiscal neutrality, as is Michigan's, or toward equalization, as is New Mexico's. Or it can compromise. California, Florida, and Kansas enacted compromise plans in the sense that, unlike New Mexico, they permit districts to determine their own tax rates and, hence, revenues; but, unlike Michigan, they limit districts' choices. The limits hinder progress toward fiscal neutrality while the permitted discretion impairs equalization.

We are not suggesting that such compromises are in any sense "wrong" or "improper." Rather, we are suggesting that local control over budgets and tax rates is the "price" of equalization, and that revenue and tax rate disparities are the "price" of fiscal neutrality. More generally, equalization comes at the expense of local discretion over spending and tax levels; and one reason why these plans have not provided greater equality is that they have attempted to preserve some degree of local discretion.

These plans also reflect the three-way conflict among "holding harmless" high-spending districts, tax relief, and state support for education. None of the reform plans we studied cut the revenues of previously high-spending districts. In fact, none even "capped" spending. Their various revenue and tax rate limits only constrained the growth of revenues in high-spending districts. Consequently, the low-spending districts were chasing a moving target in trying to "catch up" to their high-spending counterparts. The states increased their aid to low-spending districts, but the limits that held down revenue growth in the high-spending districts also applied, though not always as tightly, to low-spending districts, which had to translate some of their increased state aid into tax relief.

Political realities may impose a "leveling up" equalization strategy, but that approach is expensive; and the amount of equalization accomplished at a given cost to the state diminishes as state funds are translated into tax relief.

It is not within our province to judge whether equalization is more important tax relief, or whether the revenues of high-spending districts should be cut to improve equalization, or whether states should contribute more to the support of education. We merely point out that the cost of "leveling up" is greater state support for education or higher local property taxes, or both. States can obtain greater equality at a given level of support only by redirecting revenues from high-spending to low-spending districts or allowing lower-spending districts to increase their tax rates. They can provide more tax relief or greater equality of tax burdens only by redirecting revenues from high-spending to low-spending districts or by increasing state aid to education. The five states' reforms generally eased local property tax rates and very substantially equalized tax efforts across districts. The "price" of these results was less progress toward revenue equalization, given the states' ability or willingness to support education and their inability or unwillingness to cut the revenues of high-spending districts.

ADD-ONS AND ADJUSTMENTS[1]

Each of the reform plans can be viewed as a combination of a basic plan and various add-ons and adjustments that modify the distribution of state aid among districts. California adds a flat grant program ($125 per pupil) to its foundation program and permits districts to override their revenue limits with approval of the voters. Florida adjusts the distribution of state aid for the distribution of pupils among 26 categories in each district for the cost of living in the district. Kansas rebates a share of the state personal income tax receipts collected in each county to the county's school districts. Michigan's municipal overburden provision provides additional state aid to cities where nonschool tax burdens are particularly high. And New Mexico adjusts state aid according to the distribution of districts' pupils among grades and to an index of teacher costs.

These provisions have been justified on several different grounds: California's flat grant program is constitutionally mandated; its override provision presumably allows districts that are willing to exert greater tax effort for the schools an opportunity to do so. Florida's, Michigan's, and New Mexico's provisions ostensibly direct additional state aid to districts judged to have needs that are not well accommodated by the basic plan. And the income tax rebate in Kansas is supposedly a means for shifting part of the school support burden to the income tax.

Some subtle parliamentary maneuvering apparently has gone on behind the scene as well, however. Persons familiar with state school finance systems have told us, off the record, of instances where states (not necessarily those studied here) have included add-ons or adjustments to "hold harmless" high-spending districts. Allegedly, states under political or judicial pressure to reform, but unable either to cut the revenues of high-spending districts or

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[1]The add-ons and adjustments discussed here are those in operation in each state in the years covered by our data. Some of the states have recently added, deleted, or modified such provisions, but we lack the data to assess the consequences.

provide enough additional state aid to "level up" low-spending districts found an ingenious way out. They searched for a characteristic that was common to high-spending districts and rare in low-spending districts. They then provided an aid adjustment to "offset the unusual costs" incurred by districts with that characteristic. The result was an ostensibly equitable school finance plan that preserved the revenues of high-spending districts but did not require additional state support to the others.

In any event, whatever the purposes of add-ons or adjustments might have been, and however appropriate they might be to the circumstances of a particular state, their effects on equalization and fiscal neutrality are of interest.

California's flat grants are counted against a district's foundation aid, and thus add nothing to the revenues of districts receiving foundation support. Nearly half the districts in the state, however, are not entitled to foundation support because their tax bases are so large.[1] But, these districts receive the flat grants which thereby partially offset the equalizing effects of the foundation program.

The ability to override the revenue limit (formally, to levy a tax rate in excess of the rate which yields the revenue limit) reduced the equalization effect of the revenue limits. More important, high-wealth and high-spending districts most frequently obtained overrides. Thus, both equalization and fiscal neutrality were impaired by the override provision.

Florida's pupil-weighting system has no impact whatsoever on the distribution of revenues. The correlation between weighted pupils and unweighted pupils across Florida's districts is extremely high (greater than .999). A foundation plan that guaranteed about 1.26 times as much support per unweighted pupil[2] would have led to exactly

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[1] A district is not entitled to foundation support if its property tax base is so large that its (hypothetical) local revenues at the computational tax rate exceed the foundation guarantee.

[2] The coefficient on unweighted pupils in a simple regression on weighted pupils was just over 1.26.

the same distribution of revenues. The cost-of-living adjustment however, has a decided effect on the distribution of revenues; it introduces substantial revenue disparities. Moreover, the cost of living tends to be high where wealth, and particularly income, are high. The adjustment therefore directs additional revenues to high-wealth and high-income districts, adversely affecting wealth neutrality and introducing very substantial income bias into the distribution of revenues.

Kansas's income tax rebate essentially provides support in proportion to the taxable income of a county's residents. School districts in high-income counties therefore levy lower property tax rates to stay within their budget limit. The net effect is a reduction in the property taxes paid by residents of higher-income counties.

Michigan's municipal overburden provision distributes a small amount of funds, most of which go to Detroit. Because Detroit has above average per-pupil revenues and wealth, the provision is disequalizing and reduces fiscal neutrality. However, the amount of funds involved is so small relative to state equalization aid that the adverse effects on equalization and fiscal neutrality are negligible.

The teachers' cost-adjustment provision in New Mexico's reform plan allows greater revenues to districts whose teachers are relatively highly educated and experienced. We suspect that this provision accounts for the rather surprising New Mexico results. The state shifted from the least equalizing pre-reform finance system--flat grants--to a plan tantamount to full state assumption. Yet this shift accounted for a reduction of only about 20 percent in revenue disparities. The puzzling question is why a shift from a flat grant system to a system that ostensibly guaranteed equal revenues to every district failed to bring about greater equality. The reason, we suspect, is that some of New Mexico's districts took advantage of their opportunities prior to reform and raised greater per-pupil revenues than did other districts. They then used these

funds to employ more educated and experienced teachers than lower-wealth districts could afford. Their teachers' experience and education index accordingly would be relatively high in the post-reform years, raising their revenue entitlements according to the formula.

We could not explicitly test this hypothesis, because the data we obtained did not provide information on teachers' experience and education adjustment factors. However, it is consistent with the available data. Note also that this feature of New Mexico's plan has a tendency to "lock in" revenue disparities whether or not they are associated with wealth. A district that entered the reform era with a highly educated and experienced staff had a high adjustment factor, generating high revenues that allowed it to retain a highly qualified staff. In contrast, a district with a much less qualified staff at the outset of reform had a low adjustment factor, generating lower revenues, and therefore could not as readily hire highly qualified new teachers. This feature of the plan consequently appears to run counter to the ultimate objective of reform: reducing inter-district disparities in the quality of education offered to children.

The fiscal limits or constraints imposed by California, Florida, Kansas, and New Mexico have also figured importantly in their reforms. Depending on one's point of view, revenue or tax rate limits may be interpreted as devices for bringing about gradual equalization, for delaying equalization, for limiting disparities in a system that permits local discretion, for controlling the cost of state aid, or for forcing local districts to translate a part of their state aid into local property tax relief.

REFORM AS A PREVENTIVE TO FURTHER DISPARITY

Our study compared pre-reform and post-reform distributions and relationships in five states. Most states annually reset their school finance systems' parameters, and year-to-year increases in state aid to education are common. It is beyond the scope of this study to speculate on what changes the five states would have made if they had not restructured their finance systems, and how those changes would have affected the distributions and relationships of interest.

But it is possible, perhaps even likely, that disparities in these states would have widened in the absence of reform. If so, these reforms have been more successful than suggested by the data examined here.

Appendix

STATISTICAL TABLES

Table A.1

COEFFICIENTS OF VARIATION FOR REVENUES, INSTRUCTIONAL EXPENDITURES, AND ADJUSTED TAX RATES

State and Variable	Pre-reform 1970-71	1971-72	1972-73	Post-reform 1973-74	1974-75	1975-76	1976-77
Revenues							
California							
Elementary	.22	.23	.22	.21	.20	.18	.18
High school	.17	.18	.18	.19	.17	.17	.16
Unified	.18	.19	.18	.16	.14	.14	.13
Florida			.12			.13	
Kansas							
ADM below 400			.23	.21	.22		
ADM 400 to 1299			.21	.18	.20		
ADM 1300 and above			.12	.11	.10		
Michigan		.15	.17	.15	.14	.16	
New Mexico			.17	.18	.12	.10	
Instructional expenditures							
California							
Elementary	.17	.17	.17	.16	.18	.16	.15
High school	.14	.15	.15	.14	.16	.15	.14
Unified	.17	.17	.18	.17	.18	.15	.13
Florida			.12			.14	
Kansas							
ADM below 400			.21	.21	.20		
ADM 400 to 1299			.19	.17	.19		
ADM 1300 and above			.11	.09	.09		
New Mexico			.11	.11	.10	.09	
Adjusted tax rates							
California							
Elementary	.22	.23	.23	.22	.17	.17	.17
High school	.17	.17	.17	.15	.13	.14	.14
Unified	.17	.16	.17	.15	.14	.13	.12
Florida			.11			.10	
Kansas							
ADM below 400			.28	.20	.19		
ADM 400 to 1299			.28	.23	.18		
ADM 1300 and above			.22	.23	.15		
Michigan		.20	.24	.18	.15	.14	
New Mexico			.29	.31	.10	.00	

Table A.2

ELASTICITIES OF REVENUES PER PUPIL AND INSTRUCTIONAL EXPENDITURES PER PUPIL WITH RESPECT TO ADJUSTED WEALTH PER PUPIL

	Pre-reform			Post-reform			
State and Variable	1970 -71	1971 -72	1972 -73	1973 -74	1974 -75	1975 -76	1976 -77
Revenues							
California							
Elementary	.195	.214	.241	.202	.180	.150	.148
High school	.380	.399	.396	.388	.329	.331	.307
Unified	.289	.320	.332	.250	.236	.203	.205
Florida			.199			.214	
Kansas							
ADM below 400			.471	.349	.444		
ADM 400 to 1299			.420	.326	.352		
ADM 1300 and above			.219	.111	.141		
Michigan		.253	.235	.236	.233	.238	
New Mexico			.147	.179	.102	.046	
Instructional expenditures							
California							
Elementary	.096	.105	.108	.090	.117	.101	.104
High school	.266	.267	.286	.261	.266	.268	.247
Unified	.224	.235	.256	.249	.248	.217	.179
Florida			.183			.213	
Kansas							
ADM below 400			.381	.371	.328		
ADM 400 to 1299			.352	.326	.285		
ADM 1300 and above			.127	.145	.145		
New Mexico			.058	.046	.047	.045	

Table A.3

ELASTICITIES OF REVENUES PER PUPIL AND INSTRUCTIONAL EXPENDITURES PER PUPIL WITH RESPECT TO HOUSEHOLD INCOME PER PUPIL

	Pre-reform			Post-reform			
State and Variable	1970 -71	1971 -72	1972 -73	1973 -74	1974 -75	1975 -76	1976 -77
Revenues							
California							
Elementary	.197	.199	.198	.197	.185	.160	.149
High school	.268	.274	.255	.262	.219	.184	.134
Unified	.210	.185	.099	.151	.101	.106	.093
Florida			.087			.306	
Kansas							
ADM below 400			.176	.204	.240		
ADM 400 to 1299			.227	.275	.375		
ADM 1300 and above			.201	.240	.231		
Michigan		.274	.252	.251	.233	.150	
New Mexico			.044	.017	.001	.000	
Instructional expenditures							
California							
Elementary	.145	.146	.152	.135	.136	.126	.124
High school	.153	.150	.153	.116	.099	.072	.077
Unified	.183	.204	.182	.131	.135	.118	.110
Florida			.099			.348	
Kansas							
ADM below 400			.159	.232	.226		
ADM 400 to 1299			.273	.331	.326		
ADM 1300 and above			.291	.264	.233		
New Mexico			.180	.177	.198	.209	

Table A.4

ELASTICITIES OF REVENUES PER PUPIL AND INSTRUCTIONAL EXPENDITURES PER PUPIL WITH RESPECT TO ADJUSTED TAX RATES

State and Variable	Pre-reform 1970 -71	1971 -72	1972 -73	Post-reform 1973 -74	1974 -75	1975 -76	1976 -77
Revenues							
California							
Elementary	.167	.138	.135	.434	.385	.159	.138
High school	-.222	-.284	-.275	.494	.341	.232	.107
Unified	-.186	-.207	-.351	.216	.152	.039	.037
Florida			.581			.145	
Kansas							
ADM below 400			.097	.549	.145		
ADM 400 to 1299			.209	.420	.168		
ADM 1300 and above			.141	.322	.353		
Michigan		.451	.498	.574	.636	.667	
New Mexico			.306	-.217	.201	.000	
Instructional expenditures							
California							
Elementary	.259	.235	.257	.422	.300	.073	.029
High school	-.057	-.048	-.097	.225	.070	-.047	-.103
Unified	-.045	-.056	-.113	.240	.126	-.007	-.003
Florida			.467			.084	
Kansas							
ADM below 400			-.125	.491	.093		
ADM 400 to 1299			-.201	.376	.204		
ADM 1300 and above			.223	.242	.317		
New Mexico			.187	-.143	.014	.000	

Table A.5

RATIOS OF AVERAGE PER-PUPIL REVENUES IN DISTRICTS BELOW THE MEDIAN ON A DISTRICT CHARACTERISTIC TO AVERAGE PER-PUPIL REVENUES IN DISTRICTS ABOVE THE MEDIAN ON THE CHARACTERISTIC

State and Characteristic	Pre-reform 1970-71	1971-72	1972-73	Post-reform 1973-74	1974-75	1975-76	1976-77
Size							
California							
Elementary	1.04	1.05	1.06	1.04	1.08	1.07	1.05
High school	1.05	1.05	1.10	1.11	1.02	1.07	1.07
Unified	1.00	0.98	0.92	1.00	0.98	0.98	1.00
Florida			0.97			0.89	
Kansas							
ADM below 400			1.32	1.23	1.30		
ADM 400 to 1299			1.16	1.13	1.12		
ADM 1300 and above			0.96	0.91	0.93		
Michigan		0.90	0.93	0.90	0.91	0.91	
New Mexico			1.09	1.12	1.06	1.05	
% Urban							
California							
Elementary	0.93	0.93	0.93	0.94	0.96	0.95	0.96
High school	0.96	0.97	0.99	1.00	0.98	1.02	1.02
Unified	0.95	0.93	0.89	0.96	0.95	0.95	0.97
Florida			0.96			0.88	
Kansas							
ADM below 400			1.10	1.09	0.99		
ADM 400 to 1299			1.11	1.04	1.11		
ADM 1300 and above			0.95	0.90	0.94		
Michigan		0.90	0.93	0.88	0.88	0.88	
New Mexico			1.09	1.10	1.04	1.01	
% White							
California							
Elementary	1.01	1.01	1.02	1.02	1.00	1.01	1.02
High school	1.07	1.06	1.05	1.07	1.05	1.05	1.06
Unified	1.05	1.06	1.14	1.04	1.06	1.05	1.04
Florida			1.06			1.05	
Kansas							
ADM below 400			0.84	0.91	0.99		
ADM 400 to 1299			0.90	0.93	0.94		
ADM 1300 and above			0.98	1.03	0.99		
Michigan		1.04	1.00	1.04	1.03	1.03	
New Mexico			1.08	1.06	0.99	0.98	
% Poverty							
California							
Elementary	1.15	1.16	1.15	1.10	1.10	1.08	1.08
High school	1.10	1.09	1.09	1.07	1.07	1.03	1.02
Unified	0.99	0.97	0.93	1.00	0.97	0.98	0.98
Florida			1.06			1.18	
Kansas							
ADM below 400			0.97	1.08	1.20		
ADM 400 to 1299			1.00	0.99	1.01		
ADM 1300 and above			1.06	1.08	1.07		
Michigan		1.06	1.10	1.05	1.06	1.06	
New Mexico			0.98	0.99	1.00	1.01	

Table A.6

RATIOS OF AVERAGE PER-PUPIL INSTRUCTIONAL EXPENDITURES IN DISTRICTS BELOW THE MEDIAN ON A DISTRICT CHARACTERISTIC TO AVERAGE PER-PUPIL INSTRUCTIONAL EXPENDITURES IN DISTRICTS ABOVE THE MEDIAN ON THE CHARACTERISTIC

State and Characteristic	Pre-reform 1970-71	1971-72	1972-73	Post-reform 1973-74	1974-75	1975-76	1976-77
Size							
California							
Elementary	0.98	0.99	0.98	0.96	1.02	1.01	1.01
High school	1.02	1.02	1.05	1.07	1.02	1.05	1.02
Unified	0.96	0.97	0.95	0.94	0.98	1.01	0.99
Florida			0.96			0.89	
Kansas							
ADM below 400			1.25	1.21	1.21		
ADM 400 to 1299			1.12	1.12	1.14		
ADM 1300 and above			0.90	0.93	0.94		
New Mexico			1.07	1.06	1.04	1.07	
% Urban							
California							
Elementary	0.93	0.91	0.91	0.92	0.96	0.95	0.94
High school	0.99	0.99	0.99	1.02	1.05	1.05	1.05
Unified	0.96	0.98	0.96	0.95	0.98	1.01	1.03
Florida			0.96			0.85	
Kansas							
ADM below 400							
ADM 400 to 1299			1.07	1.05	1.05		
ADM 1300 and above			0.89	0.93	0.94		
New Mexico			1.02	1.02	0.99	0.97	
% White							
California							
Elementary	1.04	1.04	1.04	1.05	1.02	1.02	0.99
High school	1.08	1.06	1.06	1.06	1.06	1.10	1.09
Unified	1.08	1.08	1.10	1.10	1.04	1.01	0.99
Florida			1.06			1.10	
Kansas							
ADM below 400			0.91	0.91	0.94		
ADM 400 to 1299			0.92	0.93	0.92		
ADM 1300 and above			1.01	0.98	0.97		
New Mexico			1.00	1.00	0.98	0.97	
% Poverty							
California							
Elementary	1.09	1.10	1.11	1.07	1.11	1.12	1.13
High school	1.05	1.05	1.06	1.03	1.02	1.00	0.99
Unified	0.96	0.97	0.95	0.94	0.98	1.00	1.03
Florida			1.06			1.18	
Kansas							
ADM below 400			1.05	1.09	1.11		
ADM 400 to 1299			1.01	1.00	1.01		
ADM 1300 and above			1.09	1.07	1.06		
New Mexico			1.01	1.00	1.04	1.04	

Table A.7

RATIOS OF AVERAGE ADJUSTED TAX RATES IN DISTRICTS BELOW THE MEDIAN ON A DISTRICT CHARACTERISTIC TO AVERAGE ADJUSTED TAX RATES IN DISTRICTS ABOVE THE MEDIAN ON THE CHARACTERISTIC

State and Characteristic	Pre-reform 1970-71	1971-72	1972-73	Post-reform 1973-74	1974-75	1975-76	1976-77
Size							
California							
Elementary	0.86	0.85	0.84	0.89	0.93	0.91	0.90
High school	0.91	0.90	0.88	0.99	0.95	0.98	0.97
Unified	1.00	0.98	1.00	0.97	0.93	0.96	0.96
Florida			0.93			0.96	
Kansas							
ADM below 400			0.95	1.17	0.99		
ADM 400 to 1299			0.93	0.93	0.97		
ADM 1300 and above			0.78	0.73	0.80		
Michigan		0.88	0.92	0.87	0.88	0.88	
New Mexico			1.07	1.16	0.97	1.00	
% Urban							
California							
Elementary	0.88	0.89	0.90	0.90	0.93	0.95	0.95
High school	0.98	0.97	1.00	0.99	1.00	1.06	1.01
Unified	1.04	1.02	1.05	1.00	0.93	0.98	0.97
Florida			0.95			0.99	
Kansas							
ADM below 400			1.00	1.04	0.95		
ADM 400 to 1299			0.89	0.96	0.94		
ADM 1300 and above			0.75	0.72	0.80		
Michigan		0.89	0.93	0.86	0.86	0.87	
New Mexico			1.03	1.08	0.97	1.00	
% White							
California							
Elementary	1.01	1.02	1.02	1.02	1.02	1.04	1.06
High school	0.94	0.92	0.91	0.95	0.96	0.98	1.01
Unified	0.99	0.99	0.98	1.02	1.07	1.02	1.04
Florida			1.05			1.05	
Kansas							
ADM below 400			1.12	0.96	1.03		
ADM 400 to 1299			1.11	1.03	1.07		
ADM 1300 and above			1.16	1.18	1.11		
Michigan		0.99	0.93	1.01	1.02	1.01	
New Mexico			1.17	1.18	1.04	1.00	
% Poverty							
California							
Elementary	1.17	1.17	1.16	1.17	1.10	1.07	1.05
High school	1.09	1.06	1.06	1.09	1.06	1.00	0.98
Unified	1.07	1.07	1.09	1.04	0.97	1.01	0.99
Florida			0.97			0.99	
Kansas							
ADM below 400			0.90	1.05	1.08		
ADM 400 to 1299			1.05	1.07	1.02		
ADM 1300 and above			1.24	1.20	1.12		
Michigan		1.18	1.26	1.14	1.11	1.11	
New Mexico			0.99	0.98	1.05	1.00	

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